

Listing of Claims:

1-16 (Cancelled)

17. (Previously Presented) A coated metallic substrate comprising an anticorrosion coating formed by:

obtaining a coating composition including in the following proportions

(percentages by weight): at least one of an organic titanate and an organic zirconate in an amount from 0.3 to 24%, a particulate metal or a mixture of particulate metals in an amount from 10 to 40%, a silane-based binder in an amount from 1 to 25%, and water in an amount sufficient to produce 100%, wherein the sum of the organic titanate and/or zirconate and of the silane-based binder is between 5 and 25%;

forming a coating layer by spraying, soaking-draining or soaking-centrifugation;

and

subjecting the coating layer to a baking operation at a temperature of between 180°C and 350°C by supply of thermal energy to thereby form the anticorrosion coating.

18 (Withdrawn) An aqueous composition of C₁-C₈ tetraalkyl titanate, adapted for use in a coating composition for a metallic substrate in aqueous dispersion, in the following proportions (percentages by weight):

water-soluble organic solvent in an amount from 0 to 20%.

silane-based binder in an amount from 20 to 50%, the silane having at least one hydrolysable hydroxyl function; at least one of C₁-C₈ tetraalkyl titanate and zirconate in an amount from 5 to 25%, compatible in organic phase; and water in an amount sufficient to produce 100%.

19. (Withdrawn) The composition according to claim 18, wherein the water-soluble organic solvent is selected from the group consisting of glycolic solvents, alcohols, ketones, and mixtures thereof.

20. (Withdrawn) The composition according to claim 18 wherein the hydrolysable hydroxyl function is a C₁-C₄ alkoxy radical.

21. (Withdrawn) The composition according to claim 18 wherein the silane includes an epoxy function.

22. (Withdrawn) The composition according to claim 21, wherein the silane is selected from the group consisting of di- or trimethoxysilane with an epoxy function, di- or triethoxysilane with an epoxy function, and mixtures thereof.

23. (Withdrawn) The composition according to claim 18 wherein the C₁-C₈ tetraalkyl titanate is selected from the group consisting of tetraethyl titanate, tetra-n-butyl titanate, octylene glycol titanate and mixtures thereof.

24-58 (Cancelled)

59. (Previously Presented) The metallic substrate of claim 17 wherein the metallic substrate is selected from the group consisting of steel, zinc-coated steel, steel covered with a zinc-based coating, cast-iron, and aluminium.

60. (Previously Presented) The metallic substrate of claim 59 wherein the metallic substrate is steel covered with a zinc-based coating.

61. (Withdrawn) The composition of claim 19 wherein the glycolic solvents include glycol ethers.

62. (Withdrawn) The composition of claim 61 wherein the glycol ethers are selected from the group consisting of diethylene glycol, triethylene glycol, dipropylene glycol, and mixtures thereof.

63. (Withdrawn) The composition of claim 19 wherein the glycolic solvents include propylene glycol, propylene glycol methyl ether, and mixtures thereof.

64. (Withdrawn) The composition according to claim 19 wherein the hydrolysable hydroxyl function is a C₁-C₄ alkoxy radical.

65. (Withdrawn) The composition according to claim 22 wherein the trimethoxysilane is selected from the group consisting of gamma-glycidoxypropyltrimethoxysilane, beta-(3,4-epoxycyclohexyl)ethyltrimethoxysilane, and mixtures thereof.

66. (Withdrawn) The composition according to claim 18 wherein the C₁-C₈ tetraalkyl zirconate is selected from the group consisting of tetra-n-propyl zirconate, tetra-n-butyl zirconate, and mixtures thereof.

67. (Withdrawn) A method for pretreating a substrate prior to receiving an adhesive or coating, the method comprising:

providing a composition comprising in the following proportions (percentages by weight): water-soluble organic solvent in an amount from 0 to 20%, silane-based binder in an amount from 20 to 50% the silane having at least one hydrolysable hydroxyl function, at least one of C₁-C₈ tetraalkyl titanate and zirconate in an amount from 5 to 25% compatible in organic phase, and water in an amount sufficient to produce 100%;

applying a coating of the composition to the substrate, to thereby pretreat the substrate.

68. (Withdrawn) A method for sealing a substrate or coated substrate, the method comprising:

providing a substrate or coated substrate;

providing a composition comprising in the following proportions (percentages by weight): water-soluble organic solvent in an amount from 0 to 20%, silane-based binder in an amount from 20 to 50% the silane having at least one hydrolysable hydroxyl function, at least one of C₁-C₈ tetraalkyl titanate and zirconate in an amount from 5 to 25% compatible in organic phase, and water in an amount sufficient to produce 100%; applying a coating of the composition on the substrate, to thereby seal the substrate or coated substrate.

69. (Withdrawn) A method for passivating a substrate of steel, zinc, aluminium, or steel having a zinc-based coating, the method comprising:
providing a substrate selected from the group consisting of steel, zinc, aluminium, and steel having a zinc-based coating;
providing a composition comprising in the following proportions (percentages by weight): water-soluble organic solvent in an amount from 0 to 20%, silane-based binder in an amount from 20 to 50% the silane having at least one hydrolysable hydroxyl function, at least one of C₁-C₈ tetraalkyl titanate and zirconate in an amount from 5 to 25% compatible in organic phase, and water in an amount sufficient to produce 100%; applying a coating of the composition on the substrate, thereby passivating the substrate.

70. (Withdrawn) A method for improving the adhesion of coatings or adhesives in aqueous phase, the method comprising:

forming a composition comprising in the following proportions (percentages by weight): water-soluble organic solvent in an amount from 0 to 20%, silane-based binder in an amount from 20 to 50% the silane having at least one hydrolysable hydroxyl function, at least one of C₁-C₈ tetraalkyl titanate and zirconate in an amount from 5 to 25% compatible in organic phase, and water in an amount sufficient to produce 100%; adding the composition to a coating or adhesive to thereby improve the resulting adhesion of the coating or adhesive.

71. (Previously Presented) The metallic substrate of claim 17 wherein (i) the organic titanate is selected from the group consisting of titanates compatible in organic phase, titanates compatible in aqueous phase, and combinations thereof, and (ii) the organic zirconate is selected from the group consisting of zirconates compatible in organic phase, zirconates compatible in aqueous phase, and combinations thereof.

72. (Previously Presented) The metallic substrate of claim 71 wherein the titanates compatible in organic phase are C₁-C₈ tetraalkyl titanates and the zirconates compatible in organic phase are C₁-C₈ tetraalkyl zirconates.

73. (Previously Presented) The metallic substrate of claim 72 wherein the C₁-C₈ tetraalkyl titanates are selected from the group consisting of tetraethyl titanate, tetra-n-butyl titanate, octylene glycol titanate and combinations thereof.

74. (Previously Presented) The metallic substrate of claim 72 wherein the C₁-C₈ tetraalkyl zirconate are selected from the group consisting of tetra-n-propyl zirconate, tetra-n-butyl zirconate, and combinations thereof.

75. (Previously Presented) The metallic substrate of claim 71 wherein the titanates compatible in aqueous phase are chelated organic titanates, and the zirconates compatible in aqueous phase are chelated organic zirconates.

76. (Previously Presented) The metallic substrate of claim 75 wherein the chelated organic titanates are triethanolamine titanates.

77. (Previously Presented) The metallic substrate of claim 75 wherein the chelated organic zirconates are triethanolamine zirconates.

78. (Previously Presented) The metallic substrate of claim 17 wherein the particulate metal is selected from the group consisting of zinc, aluminium, zinc alloys, aluminium alloys, and combinations thereof.

79. (Previously Presented) The metallic substrate of claim 78 wherein the alloys include metals selected from the group consisting of manganese, magnesium, tin, and combinations thereof.

80. (Previously Presented) The metallic substrate of claim 78 wherein the alloys include a eutectic alloy of zinc and aluminium and a trace of rare earth elements.

81. (Previously Presented) The metallic substrate of claim 17 wherein the silane-based binder comprises a silane having at least one hydrolysable hydroxyl function.

82. (Previously Presented) The metallic substrate of claim 81 wherein the hydrolysable hydroxyl function is a C₁-C₈ alkoxy radical.

83. (Previously Presented) The metallic substrate of claim 17 wherein the silane includes an epoxy function.

84. (Previously Presented) The metallic substrate of claim 17 wherein the silane is selected from the group consisting of di- or trimethoxysilane with an epoxy function, di- or triethoxysilane with an epoxy function, and mixtures thereof.

85. (Previously Presented) The metallic substrate of claim 84 wherein the trimethoxysilane is selected from the group consisting of gamma-glycidoxypropyltrimethoxysilane, beta-(3,4-epoxycyclohexyl)ethyltrimethoxysilane, and mixtures thereof.

86. (Previously Presented) The metallic substrate of claim 17 wherein the coating composition further comprises 1 to 30% by weight of organic solvent or a mixture of organic solvents, with respect to the total weight of the composition.

87. (Previously Presented) The metallic substrate of claim 86 wherein the organic solvent is selected from the group consisting of glycolic solvents, acetates, nitropropane, alcohols, ketones, white spirit, and mixtures thereof.

88. (Previously Presented) The metallic substrate of claim 87 wherein the glycolic solvents are glycol ethers.

89. (Previously Presented) The metallic substrate of claim 88 wherein the glycol ethers are diethylene glycol, triethylene glycol, dipropylene glycol, propylene glycol methyl ether, and mixtures thereof.

90. (Previously Presented) The metallic substrate of claim 87 wherein the glycolic solvents are selected from the group consisting of propylene glycol, polypropylene glycol, and mixtures thereof.

91. (Previously Presented) The metallic substrate of claim 86 wherein the organic solvent is 2,2,4-trimethyl-1,3-pentanediol isobutyrate (texanol).

92. (Previously Presented) The metallic substrate of claim 17 wherein the coating composition further comprises 0.1 to 7% by weight of molybdenum oxide, with respect to the total weight of the composition.

93. (Previously Presented) The metallic substrate of claim 17 wherein the coating composition further comprises 0.5 to 10% by weight, with respect to the total weight of the composition, of an anticorrosion reinforcing agent selected from the group consisting of yttrium, zirconium, lanthanum, cerium, praseodymium, in the form of oxides or of salts thereof.

94. (Previously Presented) The metallic substrate of claim 93 wherein the reinforcing agent is Y_2O_3 .

95. (Previously Presented) The metallic substrate of claim 17 wherein the coating composition further comprises 0.2 to 4% by weight, with respect to the total weight of the composition, of a corrosion inhibitor pigment.

96. (Previously Presented) The metallic substrate of claim 95 wherein the corrosion inhibitor pigment is aluminium triphosphate.

97. (Previously Presented) The metallic substrate of claim 17 wherein the coating composition further comprises a thickening agent, a wetting agent, and combinations thereof.

98. (Previously Presented) The metallic substrate of claim 97 wherein the thickening agent is present in an amount of 0.005 to 7% by weight with respect to the total weight of the coating composition.

99. (Previously Presented) The metallic substrate of claim 97 wherein the wetting agent is present in an amount of 0.1 to 4% by weight with respect to the total weight of the coating composition.

100. (Previously Presented) The metallic substrate of claim 17 wherein the baking operation by supply of thermal energy includes at least one convection, infrared, and induction.

101. (Previously Presented) The metallic substrate of claim 17 wherein the baking operation is performed for approximately 10 to 60 minutes by convection or infra-red.

102. (Previously Presented) The metallic substrate of claim 17 wherein the baking operation is performed for 30 seconds to 5 minutes by induction.

103. (Previously Presented) The metallic substrate of claim 17 wherein prior to the baking operation the coated layer is subjected to a drying operation by supply of thermal energy.

104. (Previously Presented) The metallic substrate of claim 103 wherein the drying operation by supply of thermal energy includes at least one convection, infrared, and induction.

105. (Previously Presented) The metallic substrate of claim 104 wherein the drying operation is performed at a temperature of between 30 and 250°C.

106. (Previously Presented) The metallic substrate of claim 104 wherein the drying operation is performed by convection or infra-red for approximately 10 to 30 minutes on line.

107. (Previously Presented) The metallic substrate of claim 104 wherein the drying operation is performed for 30 seconds to 5 minutes by induction.

108. (Previously Presented) The metallic substrate of claim 17 wherein the anticorrosion coating has a thickness of the dry film between 3 μm (11 g/m²) and 30 μm (110 g/m²).

109. (Previously Presented) The metallic substrate of claim 108 wherein the thickness is between 4 μm (15 g/m²) and 12 μm (45 g/m²).

110. (Previously Presented) The metallic substrate of claim 109 wherein the thickness is between 5 μm (18 g/m²) and 10 μm (40 g/m²)